

CBO

Transparency at CBO: Future Plans and a Review of 2019

APPENDIX
B

Comparing the Results of CBO's HECM Model With Those of FHA and Its Auditor

CONGRESSIONAL BUDGET OFFICE

An Overview of CBO's Life-Cycle Growth Model

February 2019

CBO

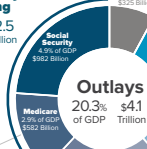
An Evaluation of CBO's Past Deficit and Debt Projections

CBO

Financial Regulation and the Federal Budget

THE FEDERAL BUDGET IN 2018

**Mandatory
Spending**
12.5% of GDP
\$2.5 Trillion



Revenues
16.5% of GDP
\$3.3 Trillion

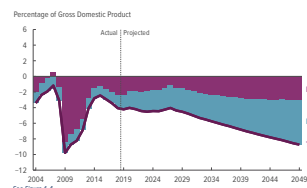
**Discretionary
Spending**
6.2% of GDP
\$1.3 Trillion

Prices for and Spending on Specialty Drugs in Medicare Part D and Medicaid

A Visual Summary of The 2019 Long-Term Budget Outlook

Each year, the Congressional Budget Office issues a set of long-term budget projections—that is, projections of what federal spending, revenues, deficits, and debt would be for the next 30 years if current laws generally did not change. CBO calls them extended baseline projections. This year's projections of federal debt are slightly lower than last year's, mainly because CBO has reduced its projections of discretionary and net interest spending. Those reductions are partially offset by a small reduction in projected revenues.

Debt and Deficits



MARCH 2020

Congressional Budget Office Cost Estimate

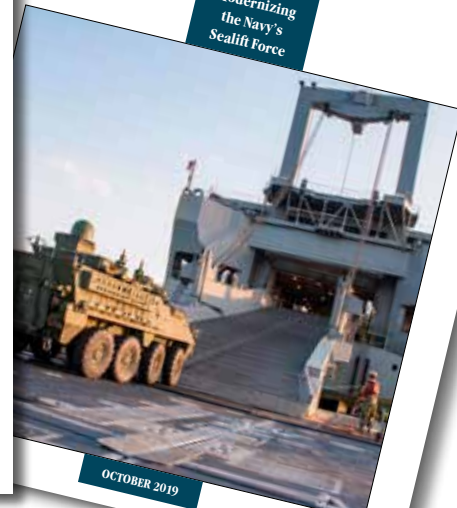
At a Glance S. 1790, National Defense Authorization Act for Fiscal Year 2020 As passed by the Senate on June 27, 2019

By Fiscal Year, Millions of Dollars	2019	2019-2024	2019-2029
Direct Spending (Outlays)	0	+	+
Revenues	0	+	-1
Deficit Effect	0	720,411	not estimated

Yes	Contains intergovernmental mandates?	Threshold Yes, Over Threshold
No	Contains private-sector mandates?	Threshold Yes, Over Threshold

CBO

Alternatives for Modernizing the Navy's Sealift Force



OCTOBER 2019

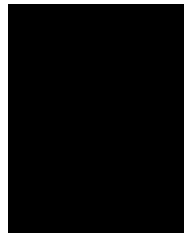
At a Glance

The Congressional Budget Office's transparency efforts aim to promote a thorough understanding of its work, help people gauge how estimates might change if policies or circumstances differed, and enhance the credibility of its analyses and processes. This report fulfills CBO's requirement to report on its plans for such efforts.

In 2020, the agency will undertake many activities, with a major focus on two:

- Explaining the methods it uses for its analyses in several topic areas, including health care, economic forecasting, and credit programs; and
- Providing additional information to help people understand CBO's cost estimates.

Those efforts will build on progress made last year, which included testifying before Congressional committees and answering Members' questions, releasing data, evaluating the accuracy of CBO's estimates, comparing current estimates with previous ones, estimating the effects of policy alternatives, characterizing the uncertainty surrounding estimates, creating data visualizations, and conducting outreach.



Contents

Summary	1
Future Plans	1
Review of 2019	2
Background	3
CBO's Transparency Plans for 2020	3
Testifying and Publishing Answers to Questions	3
Explaining Analytic Methods	3
Releasing Data	5
Analyzing the Accuracy of CBO's Estimates	5
Comparing Current Estimates With Previous Estimates	5
Comparing CBO's Estimates With Those of Other Organizations	5
Estimating the Effects of Policy Alternatives	6
Characterizing Uncertainty Surrounding Estimates	6
Creating Data Visualizations	6
Conducting Outreach	6
A Review of CBO's Transparency Efforts in 2019	7
Testifying and Publishing Answers to Questions	7
Explaining Analytic Methods	7
Releasing Data	10
Analyzing the Accuracy of CBO's Estimates	13
Comparing Current Estimates With Previous Estimates	14
Comparing CBO's Estimates With Those of Other Organizations	16
Estimating the Effects of Policy Alternatives	18
Characterizing Uncertainty Surrounding Estimates	19
Creating Data Visualizations	20
Conducting Outreach	22
List of Figures	27
About This Document	28



Transparency at CBO: Future Plans and a Review of 2019

Summary

Transparency is a top priority for the Congressional Budget Office, and the agency continues to bolster its efforts to be transparent.

When CBO says it strives to be transparent, it has three specific goals in mind:

- To promote a thorough understanding of the agency's analyses through accessible, clear, and detailed communication;
- To help people gauge how estimates might change if policies or circumstances differed; and
- To enhance the credibility of the agency's analyses and processes by showing that they are grounded in data and professional research and informed by feedback from experts.

During the appropriation process for the legislative branch in 2019, the Senate directed CBO to produce a report "detailing the agency's ongoing and future efforts to implement the multi-year plan to increase its capacity to make CBO's work as transparent and responsive as possible" within 90 days of the enactment of its appropriation for 2020.¹ This report fulfills that requirement and reviews the agency's transparency efforts during 2019. A continually updated list of CBO's most recent activities is available at www.cbo.gov/about/transparency.

Future Plans

This year, CBO will undertake many different transparency activities, including testifying before Congressional committees and answering Members' questions, releasing data, analyzing the accuracy of its estimates, comparing

current estimates with previous ones, estimating the effects of policy alternatives, characterizing the uncertainty surrounding estimates, creating data visualizations, and conducting outreach. Those projects for which the scope has been fully developed are described in this report; other projects will be initiated as well.

Explaining the methods that CBO has used to analyze the following topics will be a major focus:

- **Health care**—including the effects of preventive medical services on the federal budget, the effects of prescription drug policies on the development of new drugs, and the factors affecting employers' decisions about their health insurance offerings;
- **Economic forecasting**—including forecasting interest rates, unemployment rates, international investment and income flows, oil prices, and the effects of climate change on output;
- **Credit programs**—including the cost of guarantees of mortgage loans to veterans and income-driven repayment plans for student loans; and
- **Other topics**—including the calculation of effective tax rates, the budgetary costs of terrorism risk insurance, and how changes in the economy might affect the federal budget.

Providing information to help people understand CBO's cost estimates will also be an important focus. To that end, CBO plans to take these specific steps:

- Explain key features of cost estimates, important concepts related to the budget process, key scorekeeping guidelines and how they have been used, and how statutory pay-as-you-go procedures operate;

1. See United States Senate, *Legislative Branch Appropriations, 2020*, Report to Accompany S. 2581, Senate Report 116-124 (September 26, 2019), p. 34, <https://go.usa.gov/xdwft>.

- Describe the differences between the two methods—the method specified in the Federal Credit Reform Act of 1990 (FCRA) and the fair-value approach—used to estimate the costs of credit programs and explain the implications of incorporating market risk into estimates; and
- Describe how CBO provides information about uncertainty in its cost estimates and the methods that CBO uses to estimate the cost of certain legislative proposals that involve modeling the probabilities and costs of a range of potential outcomes.

CBO will continue to interact daily with the Congress to explain the agency's estimates and obtain feedback. The agency will also continue to regularly seek advice from outside experts.

Review of 2019

In 2019, as CBO pursued its goals for transparency, it undertook these 10 types of activities:

- **Testifying and publishing answers to questions.** CBO testified at six Congressional hearings and responded to requests from the Congress for public answers to specific questions. In addition to presenting written statements, making oral remarks, and answering questions at the hearings, the agency published answers to 65 written questions that Members submitted after the hearings in 2019.
- **Explaining its analytic methods.** CBO published various reports explaining its analyses and made supporting documents and, in some cases, computer code available. Also, in nearly every cost estimate, CBO included a section describing the basis of the estimate.
- **Releasing data.** *The Budget and Economic Outlook: 2019 to 2029, An Analysis of the President's 2020 Budget*, and several other reports were supplemented with a comprehensive set of data files, and 37 reports and working papers were accompanied by files providing the data underlying the figures in the report.
- **Analyzing the accuracy of its estimates.** CBO released various reports that compared its projections with actual outcomes.
- **Comparing its current estimates with its previous estimates.** In several of its recurring publications released in 2019, CBO explained the differences between its projections and those it had previously published. In addition, cost estimates explained the extent to which the provisions being analyzed and the estimates for them were similar to or different from those in earlier cost estimates published during the same Congressional session.
- **Comparing its estimates with those of others.** CBO regularly compared its estimates with outside estimates—including the budget projections of the Administration, the economic projections of private-sector forecasters and other government agencies, and the policy analyses of various organizations. (In addition, when time did not allow for a formal publication, CBO often discussed comparisons with Congressional staff.)
- **Estimating the effects of policy alternatives.** CBO prepared reports and created interactive products to estimate the effects that alternative assumptions about future policies would have on economic and budgetary outcomes.
- **Describing the uncertainty surrounding its estimates.** In several major reports and cost estimates, the agency discussed the uncertainty surrounding its estimates. To help convey the uncertainty surrounding its budget projections, CBO created an interactive workbook that allows users to enter alternative economic scenarios and see the likely budgetary outcomes.
- **Creating data visualizations.** To make CBO's projections and analyses easier to understand, the agency published chart books, slide decks, interactive tools, and infographics. In addition, the agency began publishing visual summaries—short summaries that use figures to highlight the main points of a report—for several of its major reports.
- **Conducting outreach.** The most important form of outreach was the direct communication between CBO and the Congress that occurs in person, by phone, and by email. In addition, CBO solicited input from a range of policy experts through its Panels of Economic and Health Advisers and obtained many external reviews of its work. CBO staff made presentations—including several on Capitol Hill in partnership with

the Congressional Research Service—about the agency’s processes and recently completed work.

Background

CBO’s transparency efforts are built on a strong foundation that has been laid over many years. Recently, the agency has allocated additional resources to do even more. For 2020, the Congress increased CBO’s budget, in part to continue hiring staff to contribute to transparency and responsiveness, building on the agency’s expansion over the past two years. Almost all CBO staff members contribute to the agency’s transparency efforts by spending at least some of their time on such activities.

As CBO continues efforts to enhance its transparency, it will be important to understand which ones are particularly valuable and informative to the Congress and which ones may have less value. The agency must constantly balance its transparency efforts with its commitment to respond quickly to the Congress’s needs and with its professional responsibility to release reports and estimates only when they reach sufficient quality. Being transparent has costs, and CBO must, in essence, make business decisions by weighing the benefits and costs of devoting resources to different activities. The agency welcomes feedback about what people find most useful and suggestions about other ways in which it can provide more information about its work.

CBO’s efforts to be transparent help it continue its long-standing commitment to providing information that is objective, insightful, timely, and clearly presented and explained. Those efforts support the agency’s dedication to maintaining a level playing field regarding access to the information and analysis that it provides—ensuring that its work is made widely available to the Congress and the public. (Work on proposals that have not been made public remains confidential to facilitate the development of legislation.)

CBO’s transparency efforts complement its process for publicly releasing all of its formal cost estimates and analytic reports. Through that process, CBO delivers its work to interested Members of Congress and their staff, including, in particular, the sponsor of legislation or requester of the report, the Chairman and Ranking Member of the committees with jurisdiction over the subject at hand, and the budget committees. At about the same time, the agency posts the work on its website.

In addition, an email service and Twitter announcements notify subscribers when the agency publishes work.

CBO’s Transparency Plans for 2020

In 2020, CBO plans to expand its efforts to undertake the 10 types of transparency activities discussed above, emphasizing in particular work that explains its analytic methods.

Testifying and Publishing Answers to Questions

In early 2020, CBO testified as planned about *The Budget and Economic Outlook: 2020 to 2030*, and expects to testify about other topics as requested by the Congress. The agency also discussed its plans for the future when testifying before the Appropriations Subcommittee on the Legislative Branch in the House and in the Senate. Testifying involves presenting written statements, making oral remarks, and answering questions at hearings, as well as publishing answers to questions that Members submit for the record after the hearings. (The agency has already published answers to 21 such questions in 2020.) CBO will continue to respond to matters raised as part of the oversight provided by the budget committees and by the Congress more broadly. In addition, the agency expects that Members of Congress will ask other questions to which it will publish responses.

Explaining Analytic Methods

In 2020, CBO will increase the number of products it releases that explain the models and methods that it uses to create cost estimates and support the analysis in its reports. Those products will cover a wide range of topics—health care, economic forecasting, credit programs, and other topics.

On health care, CBO will produce the following:

- A description of how CBO estimates the budgetary effects of preventive medical services;
- An explanation of the methods that the agency uses to project the number of new drugs coming to the market when preparing cost estimates such as that for the Lower Drug Costs Now Act (H.R. 3);
- A description of how CBO’s new health insurance simulation model, HISIM2, leverages new data to create the “synthetic firms” that it uses to estimate

whether people are offered health insurance by their employer; and

- An explanation of how HISIM2 models employers' decisionmaking about whether to offer health insurance to employees and, if they choose to do so, what type of plan to offer.

Products explaining the agency's process for **economic forecasting** will include these:

- A description of why real (inflation-adjusted) interest rates have declined over the past three decades and an assessment of whether interest rates are likely to remain low in the future;
- An explanation of one of the models that CBO uses to project the unemployment rate, which is used as an input for estimating the effects of automatic stabilizers on spending;
- An explanation of how CBO forecasts international investment and international income flows;
- A description of CBO's method for forecasting oil prices;
- An explanation of how CBO will estimate the effects of climate change on gross domestic product (GDP);
- A description of the policy growth model that underlies some of the agency's long-term policy analysis; and
- An explanation of how CBO quantifies the uncertainty in the extended baseline projections it produces for its annual *Long-Term Budget Outlook*.

The agency also plans to publish two products related to its work on **credit programs**:

- An explanation of the methods used to estimate the cost of the Department of Veterans Affairs' mortgage guarantee program; and
- A more detailed description of the analysis that CBO conducted on the characteristics of borrowers in income-driven repayment plans for student loans and the methods that it used to project borrowers' earnings, repayment, and resulting forgiveness.

Explanatory products on **other topics** scheduled to be completed this year include these:

- Descriptions of how the agency models effective tax rates for its *Budget and Economic Outlook*, along with the computer code used to calculate those rates;
- An overview of CBO's baseline projections of remittances from the Federal Reserve;
- Descriptions of the methods that CBO uses to model the probabilities and costs of a range of potential outcomes when preparing cost estimates for certain legislative proposals; and
- An explanation of how the agency evaluates changing parameters when estimating the cost of reauthorizing the Terrorism Risk Insurance Act.

Earlier this year, the agency explained its [simplified model of how macroeconomic changes might affect the federal budget](#). In addition, CBO plans to release some of the computer code from two of the models that it uses in its analyses—one that is used to project long-term budget outcomes and another that is used to estimate employers' responses in HISIM2.

CBO also plans to publish short reports providing general information to help Members of Congress, their staff, and others better understand its work. CBO's cost estimates will continue to describe the basis for the estimate. A handout explaining that and other [key features of cost estimates](#) was released in early 2020, and several other explanatory releases are scheduled to follow, including these:

- A document that provides brief explanations of some of the important concepts related to the Congressional budget process and identifies differences between some concepts that might be confused with one another—authorizations, appropriations, rescissions, and reappropriations, for example;
- A short report that explains key scorekeeping guidelines and how they have been used to prepare estimates for recent legislation;
- A document explaining pay-as-you-go procedures;

- A report that explains the differences between two methods used to estimate the costs of credit programs—the method specified in the Federal Credit Reform Act, which is required by law to be used when estimating the costs of most federal credit programs, and the fair-value approach, which incorporates market risk; and
- Additional publications explaining the meaning of, reasons for, and implications of using fair-value estimation and incorporating risk premiums in the estimated costs of federal credit programs.

Releasing Data

In 2020, CBO will continue to publish extensive sets of data in conjunction with its major recurring reports, including detailed information on the agency's 10-year budget projections; historical budget data; 10-year projections for trust funds; revenue projections, by category; spending projections, by budget account; estimates of automatic stabilizers; tax parameters and effective marginal tax rates on labor and capital; long-term budget projections; 10-year projections of economic variables (including data about the economy's maximum sustainable output); and historical economic data.

The agency will also provide details—both in spreadsheets and in PDFs—about its baseline projections for these specific programs: the Federal Pell Grant Program, student loan programs, the Children's Health Insurance Program, federal subsidies for health insurance, Medicaid, Medicare, the military retirement program, the Pension Benefit Guaranty Corporation, the Social Security Disability Insurance program, the Social Security Old-Age and Survivors Insurance program, the trust funds for Social Security, child nutrition programs, child support enforcement and collections, foster care and adoption assistance programs, the Supplemental Nutrition Assistance Program, the Supplemental Security Income program, the Temporary Assistance for Needy Families program, the unemployment compensation program, the Department of Agriculture's mandatory farm programs, federal programs that guarantee mortgages, programs funded by the Highway Trust Fund, benefits for veterans and military personnel stemming from the Post-9/11 GI Bill, and veterans' disability compensation and pension programs.

Other data will provide details about projections underlying CBO's estimates of the Social Security system's

finances and about dozens of federal credit programs. When CBO analyzes the President's budget request for 2021, it will post a set of files providing estimates of the budgetary effects of specific proposals. Likewise, when the agency publishes its analysis of the distribution of household income in 2017, it will release a table builder that allows people to explore CBO's database on the distribution of household income and federal taxes and transfers. Data have already been released this year on more than 1,000 expired or expiring authorizations of appropriations. Throughout the year, the agency will post the data underlying the figures in various reports.

Also, CBO will continue to publish information about its estimates for appropriation bills in the more accessible format that it began using in 2019.

Analyzing the Accuracy of CBO's Estimates

As part of a series of reports about the accuracy of its previous cost estimates, CBO will publish a reexamination of its original estimate of the cost of the legislation establishing the Department of Defense's Medicare-Eligible Retiree Health Care Fund. (Judging the accuracy of cost estimates for legislation that is ultimately enacted is often quite difficult—because enacted legislation may differ from an earlier version that CBO analyzed and because the actual costs or savings resulting from enacted legislation are generally a small part of a large budget account or revenue stream and cannot be separately identified.) The agency will also continue its new series of publications that review the accuracy of its outlay and revenue projections for the previous year. And the agency will publish an analysis of its previous projections of oil prices that includes an evaluation of their accuracy.

Comparing Current Estimates With Previous Estimates

In several of its recurring publications—reports about the budget and economic outlook, federal subsidies for health insurance, the costs of the Navy's shipbuilding plan, and the distribution of household income—CBO will continue to explain the differences between the current year's projections and those from the previous year. In its cost estimates, CBO will continue to identify related legislative provisions for which it has provided estimates during the current Congressional session and explain the extent to which the provisions and estimates at hand are similar or different.

Comparing CBO's Estimates With Those of Other Organizations

The agency will continue to regularly publish analyses comparing its budget projections with the Administration's and its economic projections with those of private forecasters and other government agencies. For example, one report will compare CBO's projections of the Social Security system's finances with the Social Security trustees' projections. The agency will also include comparisons of estimates in various other reports. In addition, when time does not allow for publication but interest in a comparison of CBO's estimates with others' is high, analysts will discuss such comparisons with Congressional staff.

Estimating the Effects of Policy Alternatives

In 2020, CBO will release a volume of options to reduce the deficit over the next 10 years. Reports on other topics will also illustrate the potential effects of various policy proposals; for example, the agency will publish a report discussing the budgetary effects of delaying changes to major mandatory spending programs that includes illustrative policy alternatives.

Several reports already released this year discuss policy alternatives. [One](#), a comparison of military and civilian compensation, examines approaches that could alter the way that military personnel are compensated. A [second](#) discussed several options for fielding ground-launched long-range missiles and their associated costs and benefits. A [third](#) discussed how different policies could alter the tax benefit of having dependents. And a [fourth](#), a report on the security of the electric grid, provided information on the effects of policy alternatives related to mitigating the risks and enhancing recovery efforts in the event of a widespread disruption.

Characterizing Uncertainty Surrounding Estimates

This year, CBO will publish a report that provides a general description of the sources of uncertainty surrounding its cost estimates and explains how the agency provides information about such uncertainties. Cost estimates, which are based on a template that the agency updated in 2019, will continue to feature, when necessary, a section on specific areas of uncertainty in the estimate. The agency will also publish a report explaining the methods that it uses in those cases when the estimated costs are a weighted average of the effects associated with different possible circumstances that accounts for the respective probabilities of those circumstances occurring.

Earlier this year, CBO updated its [interactive workbook](#) that shows how changes in economic conditions might affect the federal budget. *The Budget and Economic Outlook: 2020 to 2030* (published in January) included discussion of uncertainty, and a report on federal subsidies for health insurance that will be published later this year will contain such a discussion as well.

Creating Data Visualizations

This year, CBO has already published a [graphical overview](#) of the economic and budgetary effects of immigration and a [visual summary](#) of *The Budget and Economic Outlook: 2020 to 2030*; it will also create a visual summary for its upcoming report on federal subsidies for health insurance. The agency will provide additional information from that report in a slide deck and create infographics about actual outlays and revenues in 2019. CBO will update its interactive force structure tool—which allows users to manipulate the military's force structure and see the effects on the Department of Defense's operation and support costs and on the size of the military—to reflect current operating costs. And the agency will continue to look for opportunities to include graphics to enhance the explanations in some of its cost estimates.

Conducting Outreach

CBO will continue to communicate daily with people outside the agency to explain its findings and methods, respond to questions, and obtain feedback. The agency's Director will meet regularly with Members of Congress to do the same.

As the agency updates its health insurance model, it will continue to discuss the development with representatives from the Congress, federal agencies, states, insurers, employers, and others. The agency will also obtain feedback from researchers, particularly those on its Technical Review Panel, which CBO established when developing its latest model, HISIM2.

After the spring 2020 baseline is published, CBO staff will talk with Congressional staff to discuss the new projections and answer questions.

CBO will continue to obtain and respond to input from its Panel of Economic Advisers and Panel of Health Advisers. For example, in response to feedback from the Panel of Economic Advisers, CBO will produce an explanation of a model that could be used for estimating

choices that people make about whether and to what extent to participate in the labor force.

The agency will continue to turn to other experts as well. For example, it will convene a recurring meeting of crop insurance and commodity analysts to review the past performance of the crop insurance program and commodity markets and to discuss the agency's projections of future spending in those areas. Many reports will benefit from written comments made by outside experts on early drafts. For some recurring reports produced on compressed timetables, such as *The Long-Term Budget Outlook*, the agency will solicit comments on previous publications and on selected technical issues and use that feedback to improve future editions.

CBO staff will continue to give presentations on Capitol Hill—some in collaboration with the Congressional Research Service—on its budget and economic projections and on other topics. Those presentations allow CBO to explain its work and answer questions. The agency will also give presentations about its findings and about work in progress in a variety of other venues to offer explanations and gather feedback. In addition, CBO will publish HTML versions of some reports to make them more accessible.

A Review of CBO's Transparency Efforts in 2019

Throughout 2019, CBO published hundreds of products—including reports, working papers, presentations, interactive tools, data sets, and computer code—while undertaking transparency activities that can be grouped into 10 categories.

Testifying and Publishing Answers to Questions

In 2019, representatives of CBO appeared as witnesses at six Congressional hearings. In addition to presenting written statements, making oral remarks, and answering questions at the hearings, the agency published answers to written questions that Members submitted after the hearings. These are the venues and topics (along with the supplements provided):

- Before the House Budget Committee about the key design components and considerations for establishing a single-payer health care system (accompanied by a two-page [handout](#) and followed by [answers to 20 questions for the record](#) about the

current health care system and potential changes under a single-payer system);

- Before the Senate Appropriations Committee's Subcommittee on the Legislative Branch about [CBO's budget request](#), describing the agency's plans for fiscal year 2020;
- Before the Senate Budget Committee on [discretionary funding under the Budget Control Act of 2011](#) (accompanied by a spreadsheet with the [data underlying the figures](#) in the testimony and followed by [answers to 10 questions for the record](#) about budget caps, emergency funding, and other issues);
- Before the House Appropriations Committee's Subcommittee on the Legislative Branch about [CBO's budget request](#) (followed by [answers to 5 questions for the record](#) about the agency's processes, past work, and plans);
- Before the House Budget Committee about the [budget and economic outlook](#) (followed by [answers to 6 questions for the record](#) about health care, immigration, and carbon tax analyses); and
- Before the Senate Budget Committee about the [budget and economic outlook](#) (followed by [answers to 24 questions for the record](#) about the carbon tax, tax cuts, immigration reform, tariffs, deficits, debt, and other issues).

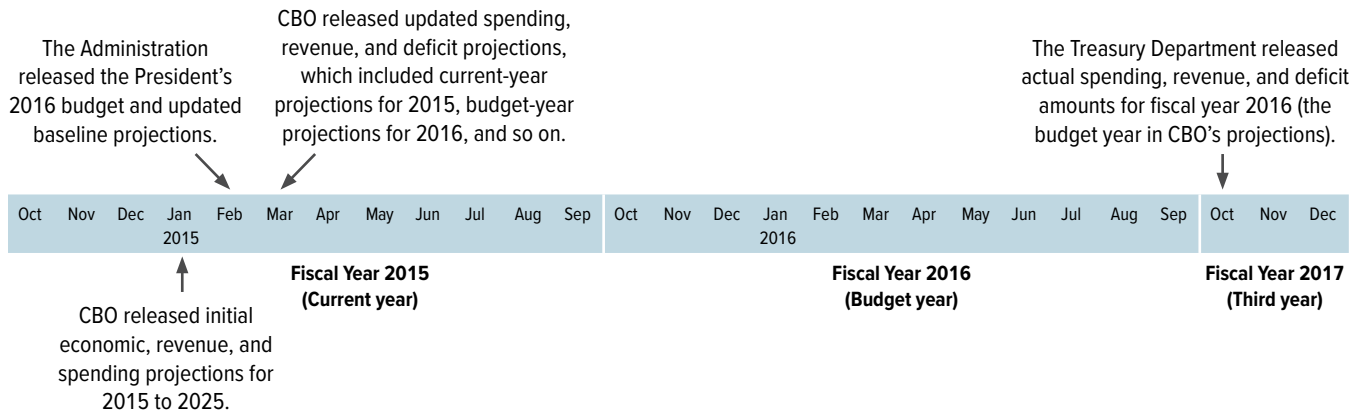
CBO's Director also answered questions in an open [executive session](#) of the Senate Finance Committee about the Prescription Drug Pricing Reduction Act of 2019. In addition, CBO answered specific questions asked by Members in several published letters: [One](#) provided information about the effects of the 2017 tax act (Public Law 115-97) on federal revenues, [another](#) was about the effects of various levels of federal debt on gross national product (GNP) and GNP per capita, and a [third](#) discussed the ability of the Secretary of Health and Human Services to negotiate the prices paid for prescription drugs under the Medicare Part D benefit.

Explaining Analytic Methods

CBO's estimates are produced by teams of people who use information obtained from experts, data, and research to determine which analytic methods to use. The agency aims to explain its methods, sometimes for a

Figure 1.

Sample Timeline for Measuring Errors in CBO's Projections of Deficits for the Budget Year



Source: Congressional Budget Office.

Dates for the budget-year projection in 2015 were used in the timeline above merely for illustrative purposes. The timelines for measuring estimates for forecasts for all budget-year projections are similar, although the President's budget has occasionally been released in months other than February.

general audience and sometimes by providing technical information.

General Information. In 2019, CBO published the following material providing details about methods underlying particular analyses:

- An [appendix](#) describing how the agency models the distribution of household income and projects the distribution in a future year;
- An [appendix](#) that describes the data that CBO used to compare its economic forecasts with those of other scholars and agencies to evaluate its economic forecasting record;
- An [appendix](#) that explains how the agency modeled the behavioral effects of levying a vehicle miles traveled tax on freight trucks;
- A [report](#) evaluating CBO's past deficit and debt projections that includes a discussion ([pages 4 to 6](#)) and an [appendix](#) describing how CBO assesses its projections (see Figure 1);
- An [appendix](#) about CBO's methods for estimating the requirements and costs of new military space organizations under different policy alternatives;
- A [report](#) explaining how CBO defines health insurance coverage and produces estimates of different types of coverage in past years, which includes a comparison of the agency's preliminary estimates based on individual sources and the final integrated estimates;
- An [appendix](#) describing the methods the agency used to estimate the federal government's expected annual spending in response to damage from hurricane winds and storm-related flooding;
- A [blog post](#) about the effects of the 2017 tax act on CBO's GDP and budget projections, which describes changes CBO made to its economic forecast since January 2017 and what portion of those changes can be attributed to the tax act;
- A [slide deck](#) about CBO's life-cycle growth model—one of the models the agency uses to estimate the long-term effects of changes in fiscal policy;
- A [report](#) describing how CBO and the staff of the Joint Committee on Taxation (JCT) analyzed the effects on health care coverage of new rules for association health plans and short-term plans; and

- An [interactive workbook](#) (a simplified version of the model that CBO uses) that allows users to simulate the agency's process for projecting discretionary budget authority and outlays for different types of federal spending over the course of 10 years.

Nearly all cost estimates include a section describing the basis of the estimate. For example, [CBO's estimate for the Blue Water Navy Vietnam Veterans Act of 2019](#) (H.R. 299) explained how the agency used information from the Department of the Navy, the Department of Veterans Affairs, and other sources to estimate how many additional veterans would receive disability benefits and the cost of their care.

Technical Information. CBO prepared the following technical documents that describe its analytic methods:

- An [appendix](#) that describes the statistical model that the agency used to estimate the annual costs of supporting military bases' daily operations;
- A [working paper](#) describing the microsimulation model that the agency uses to estimate the effects on the federal budget of proposed changes to the cost-sharing structure of the Medicare fee-for-service program;
- A [working paper](#) on inflation dynamics that uses a Phillips curve model to assess inflation expectations and to analyze the sensitivity of inflation to cyclical fluctuations in the economy;
- A [working paper](#) on federal workers' savings behavior in the Thrift Savings Plan that describes a forecasting model that CBO developed to estimate how changes to the plan's default contribution rate and employer-matching structure would affect workers' behavior;
- An [appendix](#) about the methods the agency used to estimate the effects of three options for increasing the federal minimum wage, including how CBO estimated the number of workers affected, the responsiveness of employment, the change in the wages of workers affected, and the macroeconomic feedback that would result from each option;
- A [working paper](#) that analyzes how corporate income tax rates affect flows of trade within multinational corporations by examining whether the prices that corporations set for transactions among their international affiliates are sensitive to differences in countries' tax policies;
- An [appendix](#) describing the features and variables of the model that CBO uses to simulate the cash flows of reverse mortgages under the Federal Housing Administration's Home Equity Conversion Mortgage program;
- An [appendix](#) describing the empirical model that CBO used to estimate the association between the costs of an overhaul for a Los Angeles class submarine and several explanatory factors, which the agency used to provide an alternative perspective to its primary analysis of the costs of submarine maintenance;
- A [slide deck](#) describing the agency's new health insurance simulation model and how it was used to develop CBO's baseline budget projections;
- A [working paper](#) on CBO's new health insurance simulation model that describes sources of data and how data are prepared for use in the model;
- A [working paper](#) explaining CBO's new approach to estimating how changes to medical malpractice liability laws would affect federal spending;
- A [working paper](#) examining the prices paid for specialty drugs and spending on those drugs in Medicare Part D and Medicaid that includes a description of the data and methods used; and
- An [appendix](#) describing the data and methods that CBO used to examine marginal federal tax rates on labor income.

In addition, the agency published computer code related to its analyses on these five topics:

- [Options to increase the federal minimum wage](#) (allowing researchers to calculate and display the employment elasticities CBO used to evaluate minimum wage policy alternatives);
- [The effects of financial regulation on the federal budget](#) (allowing researchers to replicate the agency's

estimates of the effects of various financial regulation scenarios);

- The effects of the Home Equity Conversion Mortgage program on the federal budget (allowing users to reproduce the baseline estimates presented in the agency’s analysis of the role of the Federal Housing Administration in the reverse-mortgage market);
- Health insurance coverage (enabling readers to better understand the methods that CBO used to simulate individuals’ and families’ health insurance choices when preparing its spring 2019 baseline budget projections); and
- Business investment (allowing users to reproduce CBO’s model for forecasting business investment).

Releasing Data

In 2019, CBO provided many files of data underlying the analysis for its major reports and a number of other studies. The agency maintains a page on its website with links to current and past releases of the [budget and economic data](#) underlying its key projections.

New files on the following topics were posted on the website at least once, and in some cases three times, in 2019 to coincide with updates the agency made to its budget and economic baselines in January, May, and August:

- 10-year budget projections, including projections of federal spending, revenues, deficits, and debt held by the public;
- Historical budget data, showing revenues, outlays, and the deficit or surplus since 1965;
- 10-year trust fund projections, showing the balances and deficits or surpluses for Social Security, Medicare, military retirement, civilian retirement, and other trust funds;
- Revenue projections, by category, with additional details about adjusted gross income, taxable income, and income tax liability;
- Spending projections, by budget account, which show budget authority and outlays organized by Treasury identification number;

- Estimates of deficits or surpluses with and without CBO’s [estimates of automatic stabilizers](#), and related estimates of GDP and the unemployment gap;
- The tax parameters and effective marginal tax rates on labor and capital used in CBO’s microsimulation tax model and economic forecast, respectively;
- Long-term budget projections, showing estimates of CBO’s key projections in a 30-year budget window;
- 10-year economic projections, showing estimates of output, prices, labor market measures, interest rates, income, and other economic factors;
- Historical economic data, including estimates of output, prices, labor market measures, interest rates, income, and other economic factors; and
- Data about the economy’s maximum sustainable output, with additional data about the natural rate of unemployment (the rate that arises from all sources other than fluctuations in the overall demand for goods and services) and related measures of the labor supply, capital services, and productivity.

CBO also maintains a page on its website with details about many of its past and current 10-year [baseline projections for selected programs](#). In all, the agency publishes 26 files with information on different programs; some of those files were updated twice in 2019, depending on the program.

Some of those files provide information on health and education programs:

- Data on the Federal Pell Grant Program include projections of the program’s three sources of funding—discretionary budget authority, which provides the largest portion and supports a maximum award that is set in the annual appropriation act; mandatory budget authority, which is specified in the Higher Education Act of 1965; and a “mandatory add-on,” which is automatically added (on the basis of a formula) to the discretionary portion of each award.
- Data on student loan programs provide details on the agency’s projections of the cost for each associated budget account as estimated using the procedures

established in the Federal Credit Reform Act, projections of loan volume and subsidy rates for the direct student loans made using those procedures, estimates of administrative costs, projections of interest rates for borrowers, and projections of the cost of the programs made using fair-value estimating procedures.

- [Data on the Children's Health Insurance Program](#) include projections of federal funding, average monthly enrollment in the program by age, average annual federal spending per enrollee, and details on the total funding available based on the budget authority and other factors.
- [Data on federal subsidies for health insurance](#) (including the effects of the Affordable Care Act) provide details about the agency's projections of health insurance coverage, projections of net federal subsidies associated with each type of insurance coverage, a comparison of current and past projections of coverage and net subsidies, and a comparison of selected projections of health insurance coverage and net federal subsidies with actual outcomes.
- [Medicaid data](#) provide details about the agency's projections of federal payments by type of Medicaid benefit, including acute care, fee-for-service, managed care, Medicare premiums, long-term care, and vaccines for children. Also included in the files are details on enrollment, total payments, and payments per enrollee by Medicaid eligibility category (aged, blind and disabled, children, and adults).
- [Medicare data](#) include detailed projections of mandatory outlays, benefit payments, annual growth rates, payment updates and changes in price indexes, enrollment, the status of the Hospital Insurance Trust Fund, and offsetting receipts.

Other program-specific files relate to Social Security and pensions:

- [Data about the military retirement program](#) include projections of the number of beneficiaries and average annual benefits for retirees and for surviving spouses and dependents of deceased service members.

- [Data about the Pension Benefit Guaranty Corporation](#) provide details on CBO's projections of premiums, interest receipts, and outlays for the single-employer program, the multiemployer program, and administrative costs.
- [Data on the Social Security Disability Insurance program](#) include projections of the number of beneficiaries, the average monthly benefit, the average wage for indexing, the maximum amount of taxable earnings, the cost-of-living adjustment, and other factors.
- [Data about the Social Security Old-Age and Survivors Insurance program](#) include projections of the number of beneficiaries and the average monthly benefit for retired workers and families and for surviving spouses and dependents. Projections of the average wage for indexing, the maximum amount of earnings that is taxable, the cost-of-living adjustment, and other factors are also provided.
- [Data on the Social Security trust funds](#) provide details about CBO's projections of outflows for benefits and other costs and of income from payroll taxes, interest, and other sources.

The program-specific files also cover other income security programs:

- [Data on child nutrition programs](#) provide details about CBO's projections of the consumer price index for food away from home and of budget authority for the National School Lunch Program, the School Breakfast Program, the Child and Adult Care Food Program, the procurement of commodities, the Summer Food Service Program, state administrative expenses, and other spending.
- [Data on child support enforcement and collections](#) include projections of administrative costs, incentive payments, and other payments, as well as projections of collection amounts.
- [Data about foster care and adoption assistance programs](#) include projections of outlays for maintenance, administration, training, and other costs, as well as projections of average monthly caseloads.

- [Data on the Supplemental Nutrition Assistance Program](#) include projections of total benefit amounts, administrative costs, average monthly participation, average monthly benefits, changes in the cost of the Thrifty Food Plan, and the unemployment rate.
- [Data on the Supplemental Security Income program](#) include projections of the number of beneficiaries who are aged, blind, or disabled adults and of the number who are blind or disabled children. Projections of the number of awards and average monthly benefits for each of those groups are also provided.
- [Data on the Temporary Assistance for Needy Families program](#) include projections of budget authority for State Family Assistance Grants, grants related to marriage and fatherhood, and other types of assistance.
- [Data about the unemployment compensation program](#) include projections of regular benefits, extended benefits, and trade adjustment assistance. Projections of average weekly benefits, the average duration of benefits, the number of people receiving first payments, the number of people in the labor force, and the unemployment rate are also provided.

Data files for some other programs are published as well:

- [Data on the Department of Agriculture’s mandatory farm programs](#) include projections of outlays for crop insurance, conservation programs, disaster assistance, and assistance from the Commodity Credit Corporation account and related accounts. Projections of the supply of the following crops and of outlays related to them are also provided: corn, soybeans, wheat, upland cotton, rice, peanuts, sorghum, barley, oats, sunflower seed, canola, flaxseed, safflower, mustard seed, inedible rapeseed, extra-long-staple cotton, dry field peas, lentils, dairy, and large and small chickpeas.
- [Data about federal programs that guarantee mortgages](#) include projections of the budgetary effects of the activities of Fannie Mae and Freddie Mac, the Federal Housing Administration’s Mutual Mortgage Insurance program, the home loan program for veterans, and the Government National Mortgage Association’s mortgage-backed securities program.

Estimates of the value of annual loans and subsidy rates are also provided.

- [Data on programs funded by the Highway Trust Fund](#) include projections of the start-of-year balances, revenues and interest, outlays, and cumulative shortfalls of the fund’s highway and transit accounts.
- [Data on Post-9/11 GI Bill benefits](#) include projections of the number of veterans and military personnel who will receive benefits and the average annual payments.
- [Data on veterans’ disability compensation and pension programs](#) include projections of the number of beneficiaries and the average annual benefits for veterans and for surviving spouses and dependents.

Three files were posted with last year’s [report on the long-term budget outlook](#):

- [Data on the long-term budget projections](#) include the parameters that CBO used in its macroeconomic model, data about demographic and economic factors, labor force participation rates by age group and sex, information about trust funds, and other details.
- [Data underlying CBO’s Social Security estimates](#) include projections of the following variables: the number of covered workers; covered and taxable earnings; the number of Old-Age, Survivors, and Disability Insurance beneficiaries; cost and income rates; the number of immigrants and emigrants; fertility rates; mortality rates; the size of the population; average interest rates; mortality improvements by age group; and labor force participation rates.
- [A file containing additional economic projections](#) provides data about labor force participation, productivity, GDP, and more.

When CBO published its [analysis of the President’s budget request for 2020](#) in May 2019, it posted 14 data files that provide projections of the budgetary effects of specific proposals that would affect these program areas: agriculture; child support; education; foster care, adoption assistance, and guardianship; health programs; the highway trust fund accounts; Medicare; mortgage

programs; the Pension Benefit Guaranty Corporation; Social Security; the Supplemental Nutrition Assistance Program; Supplemental Security Income; Temporary Assistance for Needy Families; and unemployment compensation. Also released with that report were [two additional files](#)—one providing updated spending projections by budget account and another containing data underlying the tables and figures.

In 2019, supplemental data accompanied several other analyses:

- [Data](#) on cost growth in lead ships (the first ship in a class), which accompany the report on the Navy's 2020 shipbuilding plan;
- [Data](#) underlying the long-term projections for Social Security, including projections of Social Security tax revenues and outlays, projections of GDP and taxable payroll, and estimates of the benefit reductions needed to achieve 75-year solvency;
- [Historical data](#) about the distribution of household income, including distributions by household type and income group as well as estimates of demographics, average household income, components of income before transfers and taxes, components of means-tested transfers, components of federal taxes, means-tested transfer rates, federal tax rates, shares of household income, shares of means-tested transfers, and shares of federal taxes owed;
- A [table builder](#) allowing users to build their own tables with data on the distribution of household income, federal taxes, and means-tested transfers for the years 1979 to 2016;
- [Supplemental tables](#) that provide a summary of CBO's analysis comparing FCRA and fair-value estimates for federal credit programs, identify discretionary programs with zero or negative FCRA subsidy rates and positive fair-value subsidy rates, and provide details underlying CBO's fair-value estimates;
- [Historical data](#) on the estimated federal, state, and local spending to address losses associated with 58 storms between 2005 and 2016;
- [Data](#) providing detail on each of the authorizations of appropriations catalogued in CBO's Legislative

Classification System that were incorporated into the 2019 report on expired and expiring authorizations of appropriations;

- [Data](#) about the estimated budgetary effects of laws enacted by the 115th Congress;
- [Data](#) describing the historical costs of the Department of Defense's base budget and projections of the costs under the 2019 Future Years Defense Program, by type of expenditure; and
- [Data](#) providing details on the projected costs of U.S. nuclear forces to both the Department of Defense and Department of Energy, as well as the estimated amounts budgeted for the nuclear triad.

In 2019, CBO published 37 reports and working papers that included figures illustrating key points, and it posted files containing the data underlying the figures along with each of those publications. In addition, CBO published [data](#) about the diversity of its workforce along with its report to the Congress on the work that the agency completed in 2018.

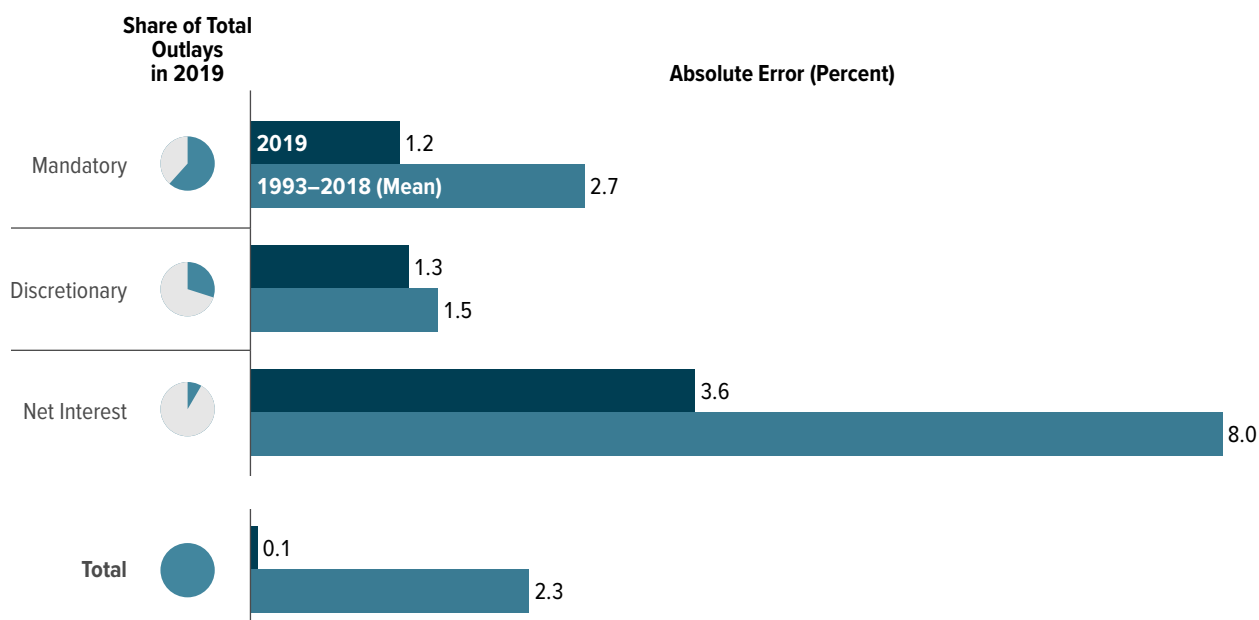
Analyzing the Accuracy of CBO's Estimates

In 2019, CBO released three broad analyses describing how the agency's projections compared with actual outcomes. The [first](#) focused on CBO's past deficit and debt projections, detailing the accuracy of the first and fifth years of each of the baseline projections the agency has made since 1984. The [second](#) compared CBO's two-year and five-year economic forecasts from as far back as 1976 to forecasts made by the Administration and the *Blue Chip* consensus. Lastly, CBO published a [report](#) that evaluated the accuracy of the baseline estimates for fiscal year 2019 that CBO published in April 2018 and compared the errors in those estimates with the agency's past projection errors (see Figure 2).

In addition, the [data file](#) containing details about CBO's revenue projections that the agency published in January 2019 (mentioned above) included tables showing differences between projected and actual amounts of total revenues, GDP, and revenues as a share of GDP for all the baseline projections that CBO has published since 1982.

In *Federal Subsidies for Health Insurance for People Under Age 65: 2019 to 2029* (pages 27 to 29), CBO

Figure 2.

Projection Errors for Outlays

Source: Congressional Budget Office.

The mean absolute error is the arithmetic average of the projection errors without regard to whether they are positive or negative, so errors in different directions do not offset one another. CBO calculated projection errors by subtracting the actual outlay amount from the projection and dividing that difference by the actual outlay amount.

The 2019 projection shown here was in CBO's adjusted April 2018 baseline budget projections, which were published in Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884. For this analysis, CBO further updated those projections to account for the estimated budgetary effects of legislation that was subsequently enacted.

The mean absolute errors are based on budget-year projections for 1993 to 2018. The budget year is the second year of the period covered by CBO's baseline projections; it usually begins several months after a spring baseline is released. The estimated budgetary effects of legislation enacted after the projections were produced, and outlays related to the activities of Fannie Mae and Freddie Mac (which are classified as mandatory), are excluded from the errors.

compared the projections for 2018 that it published in September 2017 and May 2018 with actual amounts for 2018. That analysis was a continuation of CBO's past work with JCT comparing their projections with the actual enrollment and costs reported by the Administration, state governments, and surveys.

Comparing Current Estimates With Previous Estimates

In 2019, CBO explained the differences between the current year's projections and the previous year's in several of its recurring publications—namely, its reports about the budget and economic outlook (including the May update to the budget projections and the August update to the budget and economic outlook), federal subsidies for health insurance, the long-term budget outlook, long-term Social Security projections, and the

projected costs of U.S. nuclear forces. The explanations provide insight into the agency's methods by indicating why it changed its projections. In addition, CBO described the differences between its current estimates of the effects of increasing the federal minimum wage and those estimates presented in a report on the topic that the agency had previously published. Finally, when CBO examined legislative provisions that it had analyzed in previous cost estimates, it continued its practice of explaining the extent to which the provisions and estimates resembled or differed from those in the earlier cost estimates.

In *The Budget and Economic Outlook: 2019 to 2029* (Appendix A), CBO explained the differences between CBO's current projections and those that it published last year, separating the changes it made into

three types: legislative changes, which result from laws enacted since the agency published its previous baseline projections and which generally reflect the budgetary effects reported in CBO's cost estimates when the new laws were enacted; economic changes, which arise from changes the agency has made to its economic forecast (including those made to incorporate the macroeconomic effects of recently enacted legislation); and technical changes, which are revisions to projections that are neither legislative nor economic. In addition, CBO explained the reasons for changes it made to its economic forecast since August 2018 (page 24).

In *Updated Budget Projections: 2019 to 2029* (pages 18 to 21), which the agency published in May, it explained the changes it made to its budget projections since January 2019. All of the legislation enacted after the January 2019 baseline was prepared had only a small effect on budget totals; nearly all of the revisions were technical changes.

In *An Update to the Budget and Economic Outlook: 2019 to 2029* (Appendix A), published in August, the agency explained why its baseline budget projections had changed since May of that year when the agency had last published them. The updated projections incorporated increased discretionary funding limits, supplemental appropriations for disaster relief and border security, and revisions to CBO's forecast of interest rates.

In *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2019 to 2029* (pages 23 to 27), CBO explained the reasons for the changes in its estimates of insurance coverage and subsidies that the agency had made since May 2018 when it had last updated them. The changes stemmed mainly from the following developments: CBO had lowered its projections of the total noninstitutionalized civilian population under age 65; new data and analytic methods had led the agency to increase its estimates of employment-based, Children's Health Insurance Program, and nongroup coverage; and increases in premiums in the nongroup market were smaller than it had expected.

In *The 2019 Long-Term Budget Outlook* (Appendix B), CBO explained the differences between the agency's current projections and those it published the previous year. In particular, it reviewed the reasons for changes in its projections of spending for Social Security, major health care programs, other programs, and interest, and

it discussed the reasons for changes to its projections of revenues and to its projections of Social Security's long-term finances.

In *CBO's Long-Term Social Security Projections: Changes Since 2018 and Comparisons With the Social Security Trustees' Projections* (pages 1 to 6), the agency explained the changes it had made to its long-term projections of the Social Security system's finances since the previous year. The changes were mainly due to reduced projections of interest rates, the inclusion of another year with a relatively large difference between Social Security revenues and outlays, higher projected rates of labor force participation, lower projections of the number of workers awarded disability benefits, lower projections of the share of the population age 65 or older, and some technical changes.

In *The Effects on Employment and Family Income of Increasing the Federal Minimum Wage* (Appendix A, pages 35 to 37), CBO described how the agency's methods differed from its 2014 analysis and how that affected the resulting estimates. For the new report, the agency changed the way that it projected group-specific wages, updated its estimates of the responsiveness of teen and adult employment to changes in the minimum wage, updated its estimate of the macroeconomic effects of changes in the minimum wage, and changed the way that it used underlying data to estimate hourly wage distributions and durations of unemployment.

In *Projected Costs of U.S. Nuclear Forces, 2019 to 2028* (pages 6 to 12), the agency described the changes in its estimates of the costs of nuclear forces since February 2017, when CBO last published such estimates. The differences in estimated costs over 10 years in the two reports are mainly due to the inclusion of two later years in which costs will be higher, new modernization efforts, and new weapons and support capabilities.

Cost estimates often identify bills for which similar or related estimates have been issued within the same Congress. The cost estimate for H.R. 2328, the Reauthorizing and Extending America's Community Health Act (pages 18 and 19), for example, explains which sections of the act were similar to legislation that CBO had previously analyzed and how the estimated costs for those sections differed from those the agency had previously reported.

Comparing CBO's Estimates With Those of Other Organizations

CBO regularly makes comparisons with the budget projections of the Administration, but opportunities for comparisons with other organizations are rare, primarily because not many other organizations focus on federal costs. By contrast, the agency always has the opportunity to compare its economic projections with those of private forecasters and other government agencies, and sometimes it is able to make comparisons with other organizations' policy analyses. (Some of those comparisons are discussed with Congressional staff when time does not allow for preparing a formal presentation.) CBO's estimates can differ from others' for a variety of reasons, including differences in the policies considered, the data used, the interpretation of research findings, and analytic approaches.

In *The Budget and Economic Outlook: 2019 to 2029* (pages 55 to 59), CBO compared its forecast with the range of forecasts from about 50 private-sector forecasters and three sets of forecasts from the Federal Reserve System. CBO's projections suggested similar outcomes in 2019 but a weaker short-term and long-term outlook. CBO's projections differed from those of other forecasters for a variety of reasons. For example, differences in the economic data available when the forecasts were completed may have led to differences in forecasts. In addition, there may be differences in the economic and statistical models used to prepare the forecasts, and other forecasters may assume changes in federal policies, whereas CBO's projections reflect the assumption that current laws remain unchanged.

In *An Update to the Budget and Economic Outlook: 2019 to 2029* (pages 59 to 63), the agency again compared its forecast with the range of forecasts from about 50 private-sector forecasters and three sets of forecasts from the Federal Reserve System. Compared with projections by Federal Reserve officials, CBO's suggested stronger economic outcomes in 2019, a similar outlook for 2020, and a weaker outlook for 2021 and the longer term.

In *An Analysis of the President's 2020 Budget* (pages 12 to 14), CBO estimated that the deficits that would occur under the President's proposals would be larger than the Administration projected. CBO's projections of both revenues and outlays were lower than the Administration's. CBO and the Administration used different economic

forecasts, reflecting differences in projections of economic activity under current law and in estimates of the economic effects of the Administration's proposals.

In *CBO's Long-Term Social Security Projections: Changes Since 2018 and Comparisons With the Social Security Trustees' Projections* (pages 6 to 14), CBO compared its projections of the Social Security system's finances with those of the Social Security Trustees. Both CBO and the trustees found that spending for the program would grow faster than the program's revenues, but CBO projected that the shortfall would be greater than the trustees projected (see Figure 3).

In *CBO's Economic Forecasting Record: 2019 Update* (pages 9 to 11), the agency compared the errors in its economic forecasts with private-sector forecasters' and the Administration's forecast errors. Overall, the agency found that the forecast errors of CBO, the Administration, and the private-sector forecasters were very similar in magnitude and timing.

In two of CBO's reports, *An Analysis of the Navy's Fiscal Year 2020 Shipbuilding Plan* (Appendix) and *Alternatives for Modernizing the Navy's Sealift Force* (pages 3 to 5), the agency compared its estimates with those of the Navy. The first compared the Navy's estimates of the costs of its 30-year shipbuilding plan with CBO's estimates for that plan, and the second compared the Navy's estimates of the costs of its sealift plan with CBO's cost estimates for that plan.

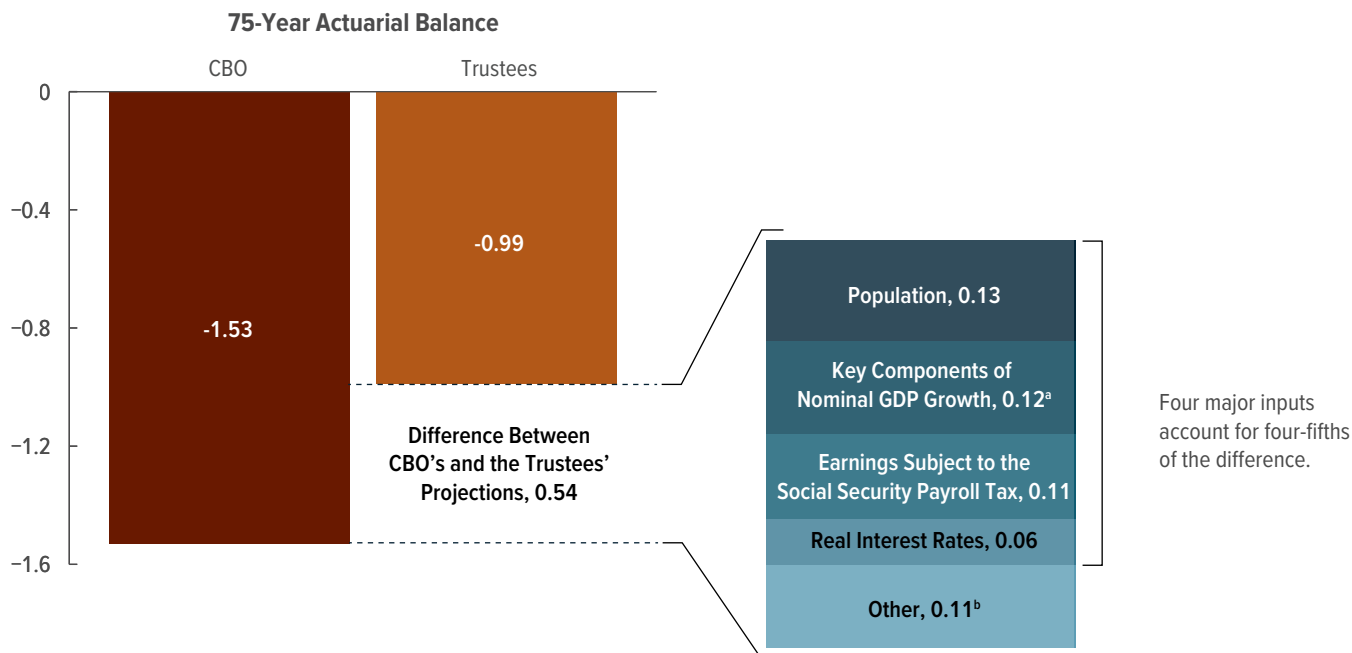
In *An Evaluation of CBO's Past Deficit and Debt Projections* (pages 11 to 12), the agency compared its projections of deficits and debt with those released by the Administration's Office of Management and Budget (OMB). For years for which comparable projections are available—1992 to 2017—errors in CBO's and OMB's projections of the deficit for the budget year have been similar.

In *The Role of the Federal Housing Administration in the Reverse-Mortgage Market* (Appendix B), CBO compared its model for assessing the effects of home equity conversion mortgages with those of the Federal Housing Administration (FHA) and an independent auditor of the FHA. CBO's and FHA's comparable results are largely similar, but CBO's and the auditor's models and results differ in important ways. For example, the auditor's model includes estimates of borrowers' behavior that

Figure 3.

Differences Between CBO's and the Social Security Trustees' Projections of the Actuarial Balance

Percentage of Gross Domestic Product



Sources: Congressional Budget Office; Social Security Trustees.

The projections incorporate the assumption that spending for Social Security continues as scheduled even if its trust funds are exhausted.

The actuarial balance is the sum of the present value of projected tax revenues and the current trust fund balance minus the sum of the present value of projected outlays and a year's worth of benefits at the end of a given period, divided by the present value of GDP or taxable payroll. (A present value expresses a flow of past and future revenues or outlays as a single amount received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, used to translate past and future cash flows into a single number.)

- a. The key components of nominal GDP growth are the labor force participation rate, the unemployment rate, the rate of productivity growth, and the inflation rate.
- b. Other differences include the differences in the projections of income taxes paid on Social Security benefits, the rates of disability insurance incidence, and interactions among the four major inputs, as well as differences that arise from the approaches that CBO and the trustees use, even when their major inputs are the same.

are more detailed than CBO's and relies on a different set of economic forecasts.

In *How CBO and JCT Analyzed Coverage Effects of New Rules for Association Health Plans and Short-Term Plans* (pages 10 and 11), CBO and JCT compared their assessment of the effects of the new rules with other published analyses. Comparing results was difficult because different organizations did not evaluate the same policy scenarios. One outcome that was straightforward to compare was the effect of the rules on premiums for nongroup plans that comply with current regulations

governing those markets. For that measure, CBO's estimate of the increase in premiums accorded with most other published estimates.

Estimating the Effects of Policy Alternatives

CBO's baseline budget projections—which are constructed in accordance with provisions of law—are intended to show what would happen to federal spending, revenues, and deficits if current laws generally remained unchanged. To assist policymakers and analysts who may hold differing views about the most useful benchmark for considering possible changes to

laws, CBO estimates how some alternative assumptions about future policies would affect budgetary projections. Estimating the effects of policy alternatives also promotes understanding of why and how estimates can differ and how large the effects of the alternatives might be.

In *The Budget and Economic Outlook: 2019 to 2029* (Chapter 5), the agency separately reported the effects of increasing discretionary appropriations at the rate of inflation after 2020, freezing discretionary appropriations at the 2019 amount, extending certain provisions of the 2017 tax act, repealing certain postponed or suspended health taxes, allowing the Administration's announced tariff plans to take effect, and reversing the Administration's tariff policies beginning in April 2019. In addition, the agency estimated an alternative fiscal scenario combining some of those alternatives.

In *The 2019 Long-Term Budget Outlook* (Chapter 2), CBO provided estimates of the budgetary effects of an extended alternative fiscal scenario, presented an analysis under which Social Security benefits were limited to the amounts payable from revenues received, and estimated the size and timing of the policy changes needed to meet various goals for deficit reduction.

In *Budgetary Outcomes Under Alternative Assumptions About Fiscal Policy*, CBO examined the budgetary effects of these alternatives to the policies incorporated in its baseline budget projections: holding discretionary spending at about 6.3 percent of GDP through 2029, freezing all discretionary appropriations at the 2019 amounts through 2029, making individual tax rates currently in effect permanent and extending other expiring revenue provisions, implementing the plans for changes in tariffs that the Administration had announced but that had not yet taken effect, and returning tariffs to their historical levels.

In addition, CBO published many products about specific policies and programs—including three new interactive tools—that compare projected economic and budgetary outcomes under multiple policy scenarios:

- In *The Effects on Employment and Family Income of Increasing the Federal Minimum Wage*, the agency examined three options for increasing the federal minimum wage. All three options gradually increased the minimum wage to a set amount—\$15 per hour, \$12 per hour, or \$10 per hour—by January 1, 2025.
- The report describes the effects of each option on employment and income. In addition, the agency published an [interactive tool](#) that allows users to explore the effects of policies that would increase the federal minimum wage, including the Raise the Wage Act, the three options analyzed in the report, and user-created policy options.
- In *Alternatives for Modernizing the Navy's Sealift Force*, the agency described and analyzed the effects of four alternatives to the Navy's plan that would provide about the same amount of sealift as the Navy's plan.
- In *Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks*, the agency explored the design choices for and implications of a tax on vehicle miles traveled and provided estimates of the budgetary effects such a tax would have under five illustrative policy scenarios.
- In *Financial Regulation and the Federal Budget*, CBO estimated the effects that three alternative policy scenarios would have on the federal budget. In addition, the agency published an [interactive sensitivity tool](#) that allows users to change capital requirements by different amounts and see how the resulting projections differ from the central estimates in the report.
- In *Accounting for Federal Retirement and Veterans' Benefits: Cash and Accrual Measures* (Chapter 3), the agency described potential approaches to expand the use of accrual measures for federal retirement and veterans' benefits and the resulting effects on the federal budget.
- In *The Role of the Federal Housing Administration in the Reverse-Mortgage Market* (Chapter 3), the agency analyzed four broad options for modifying the federal role in home equity conversion mortgages.
- In *The Personnel Requirements and Costs of New Military Space Organizations*, the agency estimated the additional costs of creating and maintaining five different kinds of space organizations, as well as the number of personnel that each type of organization would require.
- An [interactive tool](#) about the Social Security benefit system allows users to explore seven policy options

that could be used to improve the Social Security system's finances and delay exhaustion of the trust funds.

- In *Expected Costs of Damage From Hurricane Winds and Storm-Related Flooding* (pages 19 to 29), CBO described and analyzed five broad policy approaches for reducing expected storm losses.

Characterizing Uncertainty Surrounding Estimates

CBO's budget and economic projections reflect the middle of a range of outcomes under a given set of policies. CBO's analysts often test the sensitivity of their projections to identify the range of possible outcomes for those projections and to observe the way that projections change as factors vary. Likewise, in its cost estimates, CBO aims to produce estimates that generally reflect the middle of a range of the most likely budgetary outcomes that would result if the legislation was enacted. Discussion of uncertainty helps policymakers understand the factors that might cause outcomes or future estimates to differ from the agency's current estimates.

In *The Budget and Economic Outlook: 2019 to 2029*, the agency discussed the uncertainty surrounding the projections of deficits and debt (pages 17 to 20), the economic outlook (pages 51 to 54), spending (pages 85 to 86), and revenues (page 103). CBO used data about the differences between its past projections of economic output and actual amounts to put the current projections in context (see Figure 4).

CBO published an [interactive workbook](#) that illustrates how changes in economic conditions might affect the federal budget by allowing users to enter alternative scenarios for productivity growth, labor force growth, inflation, or interest rates and see projections of revenues, several types of spending, and deficits under those scenarios in relation to CBO's baseline budget projections. The estimates shown in the workbook are simplified approximations of the results that CBO's broad set of economic and budget models would yield.

In *An Update to the Budget and Economic Outlook: 2019 to 2029* (pages 26 to 27 and 53 to 58), the agency again discussed uncertainty in its budget projections and economic forecast. Those uncertainties stem mainly from differences between CBO's projections of outlays and revenues and actual outlays and revenues and from unanticipated changes in economic conditions.

In *Federal Subsidies for Health Insurance for People Under Age 65: 2019 to 2029* (pages 14 and 21 to 22), CBO and JCT discussed the uncertainty surrounding the estimates. If national economic trends diverged from CBO's economic forecast, for example, the number of people offered insurance by their employers and the number of people eligible for Medicaid or coverage through the marketplaces established under the Affordable Care Act would be affected. Another source of uncertainty was the extent to which the emergence and adoption of technology could raise or lower health care costs.

In *The 2019 Long-Term Budget Outlook* (pages 30 to 35), CBO examined the extent to which federal debt as a percentage of GDP would differ from the agency's extended baseline projections if a set of key factors—several demographic and economic factors and the growth of health care costs—deviated from the paths underlying those projections.

In *Financial Regulation and The Federal Budget* (pages 4 to 5 and 49 to 54), the agency described the major sources of uncertainty and performed sensitivity analyses to show how changing specific parameters within the model (many of which are highly uncertain) would affect the federal budget. In addition, the agency published an [interactive tool](#) that allows users to better understand the sensitivity of the analysis to specific parameters.

In *An Evaluation of CBO's Past Deficit and Debt Projections* (pages 12 to 13), the agency explained how it uses analysis of errors in its past deficit and debt projections to better quantify the uncertainty in its current baseline projections.

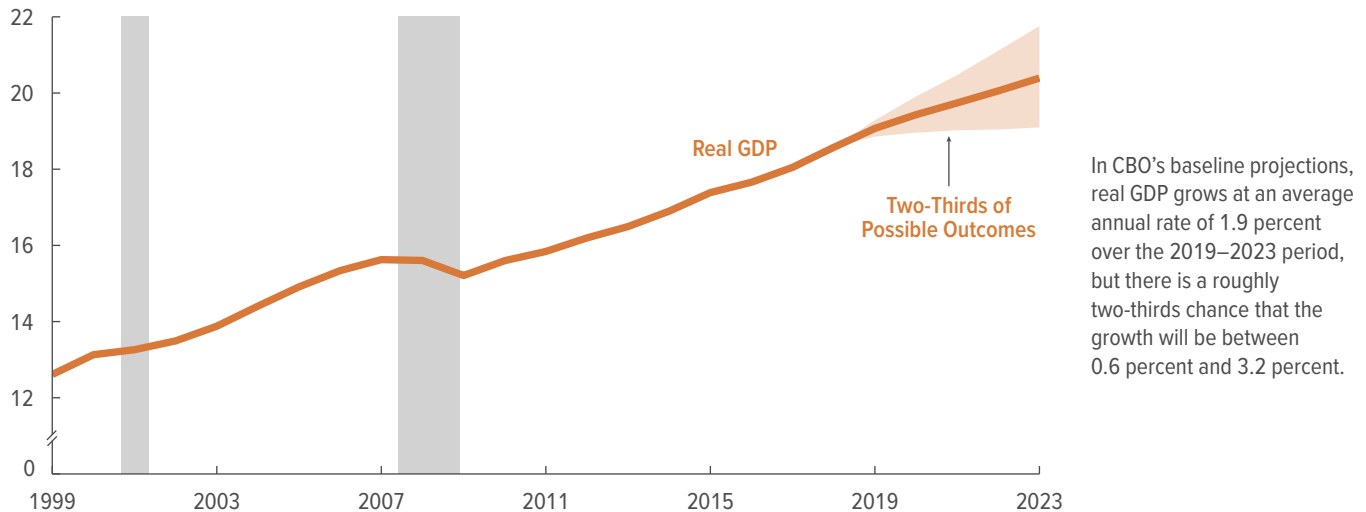
In *The Effects on Employment and Family Income of Increasing the Federal Minimum Wage* (pages 5 and 19), CBO explained that the estimates of the likely range of effects of each minimum wage option depend on, among other things, how employers and workers responds to higher wages, how much wages grow, and how long workers who lost their jobs would remain jobless.

In *The Role of the Federal Housing Administration in the Reverse-Mortgage Market* (pages 20 to 22, 24 to 25, 27 to 28, and 30 to 31), CBO described the uncertainties in its estimates of the effects of each of the policy alternatives described above. For example, there is uncertainty about how borrowers and lenders will behave in response to legislation that requires the FHA to convert the Home

Figure 4.

The Uncertainty of CBO's Projections of Output

Trillions of 2012 Dollars



Sources: Congressional Budget Office; Bureau of Economic Analysis.

Real values are nominal values that have been adjusted to remove the effects of changes in prices.

The shaded area around CBO's baseline projection of real GDP, which encompasses two-thirds of possible outcomes, is based on the errors in CBO's one-, two-, three-, four-, and five-year projections of the average annual growth rate of real GDP for calendar years 1976 through 2017.

The value of real GDP for 2018 is CBO's estimate.

GDP = gross domestic product.

Equity Conversion Mortgage program to a direct loan program.

CBO included discussion of factors contributing to uncertainty in some of the cost estimates that it prepared for proposed legislation. For example, the [cost estimate for S. 1790, the National Defense Authorization Act for Fiscal Year 2020](#), explained how the estimates of the costs of changing the security clearance process and replacing existing firefighting agents were uncertain; the actual costs would depend on how the Administration implemented those changes. In addition, estimates of the costs to restructure certain organizations and personnel of the Air Force into [new military space organizations](#) were uncertain because it was not clear how the Department of Defense would organize and staff them.

Creating Data Visualizations

To make CBO's projections and reports easier to understand, the agency publishes slide decks that highlight the key findings of its analyses. In 2019, the agency

published 10 slide decks—including the first 4 narrated by analysts:

- A [slide deck on the budget outlook](#) presented the agency's projections of revenues, spending, deficits, and debt.
- A [slide deck on the economic outlook](#) presented the agency's key economic projections, including those related to output, the labor market, inflation, and interest rates.
- A [narrated slide deck](#) presented the economic forecast.
- A [slide deck about federal subsidies for health insurance](#) presented CBO's projections of health insurance coverage and of related federal subsidies, taxes, and penalties for people under age 65.

- A narrated slide deck about the long-term budget outlook presented the agency’s 30-year projections of spending, revenues, deficits, and debt.
- A narrated slide deck on financial regulation and the federal budget described how changes in financial regulation might affect the federal budget.
- A slide deck on the distribution of household income presented household income both before tax and transfer payments and after tax and transfer payments.
- A slide deck about income growth and tax revenues in CBO’s long-term budget projections showed how real bracket creep—a process in which, as people’s income rises faster than inflation, a larger portion of income becomes subject to higher tax rates—and other factors increase federal revenues.
- A narrated slide deck about the Navy’s 2019 shipbuilding plan presented CBO’s analysis of that plan and of described how the Navy, by extending the service life of existing ships, could achieve a fleet of 355 ships by the 2030s.
- A slide deck on CBO’s life-cycle growth model described one of the models that the agency uses to estimate the long-term effects of changes in fiscal policy.

CBO has also published four infographics:

- “The Federal Budget in 2018: An Infographic” shows the major categories of federal outlays and revenues (see Figure 5). It also illustrates trends in federal deficits and debt held by the public over the past 50 years. This is the first of CBO’s regularly published infographics on the budget to feature interactive elements.
- “Mandatory Spending in 2018: An Infographic” shows changes in several categories—including spending for the major health care programs, Social Security, and income security programs—since 1998 and presents details about spending within those categories.
- “Discretionary Spending in 2018: An Infographic” shows changes in defense and nondefense

discretionary spending since 1998 and presents details about spending within those categories.

- “Revenues in 2018: An Infographic” illustrates trends in sources of federal revenues—individual income taxes, payroll taxes, corporate income taxes, and other taxes—over the past 20 years and presents details about those sources in 2018.

In addition, CBO published four chart books, which use figures to illustrate their main points:

- *Employment of People Ages 55 to 79*;
- *Federal Investment, 1962 to 2018*;
- *Social Security Replacement Rates and Other Benefit Measures: An In-Depth Analysis*; and
- *Marginal Federal Tax Rates on Labor Income: 1962 to 2028*.

CBO began publishing visual summaries in 2019. Each of the following reports included one:

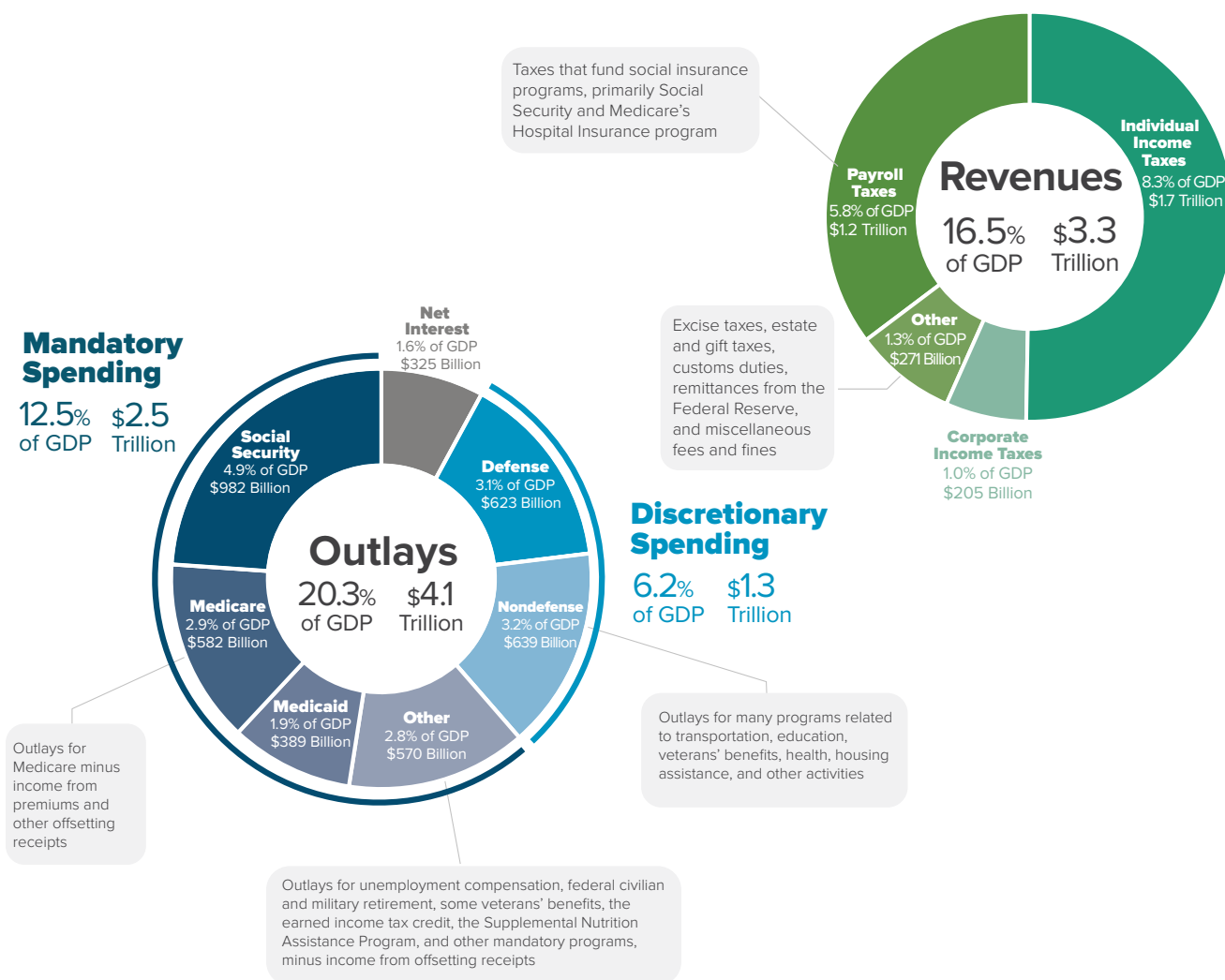
- *The Budget and Economic Outlook: 2019 to 2029*;
- *An Update to the Budget and Economic Outlook: 2019 to 2029*;
- *Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2019 to 2029*;
- *The 2019 Long-Term Budget Outlook*; and
- *Projected Changes in the Distribution of Household Income, 2016 to 2021*.

CBO also published three new interactive data visualization tools in 2019:

- An interactive tool that allows users to explore seven policy options that could be used to improve the Social Security system’s finances and delay exhaustion of the trust funds;
- An interactive tool that allows users to explore the data presented in the chart book *Social Security Replacement Rates and Other Benefit Measures: An In-Depth Analysis*; and

Figure 5.

The Federal Budget in 2018



Source: Congressional Budget Office.

- An [interactive tool](#) that allows users to explore the effects on employment and family income of policies that would increase the federal minimum wage.

Conducting Outreach

In addition to conducting the daily gathering of information that supports the agency's work, CBO staff communicate every day with people outside the agency to explain its findings and methods and to obtain feedback that helps it maintain and improve the quality of its work. In 2019, CBO updated *An Introduction to the Congressional Budget Office*, produced a [video](#) that introduces newcomers to the agency, and solicited feedback

about its work through a survey of Congressional staff. As part of its outreach, CBO consults with experts outside the organization, obtaining feedback to complement its rigorous internal review process (which involves multiple people at different levels in the organization). The agency also explains its work and obtains feedback by encouraging its staff to give presentations to various audiences. Finally, CBO continually works to make the information it provides more accessible.

Direct Communication With Members and Staff. The most important form of outreach is the direct communication between CBO and the Congress that occurs in

person, by phone, and by email. CBO's Director meets regularly with Members of Congress to explain the agency's work, respond to questions, and obtain feedback. In the first six months of Phillip Swagel's term as Director, he, accompanied by CBO staff, had dozens of meetings with Members of Congress and their staff to build relationships, learn about legislative priorities, and obtain feedback on CBO's work.

During the development of legislation, communication between CBO staff and Congressional staff is frequent. Often, after a major cost estimate is released, CBO staff reach out to staff of key committees to explain the results and answer questions.

Consultation With Outside Experts. In 2019, CBO continued its practice of extensively consulting with outside experts while preparing various analytic products. As part of its regular processes of developing cost estimates and undertaking other analyses, CBO consults with numerous outside experts who represent a variety of perspectives. The experts include professors, analysts at think tanks and consulting firms, representatives of industry groups, other experts in the private sector, and people working for federal agencies and for state and local governments. CBO obtains suggestions about whom to consult and independently seeks others so that the agency can gather information and insights from experts with varied backgrounds, training, experience, and views. (The agency always works with Congressional staff to ensure that information about a legislative proposal that they wish to keep confidential remains so during its development.) When time allows, CBO seeks external review of its methods and of drafts of reports. Such external review allows the agency's analyses to reflect both the consensus and the diversity of views of experts from around the country.

CBO's Panel of Economic Advisers met twice in 2019. As part of the [agendas for those meetings](#), CBO requested and received feedback on its economic forecasting methods and its projections of the distribution of household income in 2021. Panelists and invited experts also discussed broad issues underlying various analyses by CBO, including artificial intelligence, automation, international issues, trade policy uncertainty, and the international role of the U.S. dollar.

The [meeting of the Panel of Health Advisers](#) included presentations and discussions about state innovations in

the marketplaces established under the Affordable Care Act, the growth of health care spending, estimating the costs of single-payer proposals, and pharmaceutical innovation and pricing.

During the [meeting of the Technical Review Panel](#) to discuss HISIM2, CBO's new health insurance simulation model, CBO requested and received feedback on its modeling of employers' decisions to offer insurance, modeling of the utility that consumers obtain from insurance, and techniques for calibrating the model. In addition, CBO presented examples of policy simulations and elicited the panel's thoughts on the most important areas for CBO to build modeling capacity.

When it obtains written feedback about an analysis, CBO acknowledges that assistance in a section called About This Document at the end of a publication. CBO obtained written feedback on drafts of 33 reports and working papers in 2019, ranging from major recurring reports like *The Budget and Economic Outlook* to technical working papers, such as one about the [prices for and spending on specialty drugs in Medicare Part D and Medicaid](#).

Presentations. CBO partnered with other agencies—most often the Congressional Research Service but also the Government Accountability Office—to give the following presentations on Capitol Hill at which Congressional staff could learn more about CBO's work and have their questions answered:

- A [presentation](#) describing how changes in financial regulation affect the federal budget;
- A [presentation](#) describing the expected costs and implications for federal spending of damage from hurricane winds and storm-related flooding;
- A [presentation](#) about the prices for and spending on specialty drugs in Medicare Part D and Medicaid from 2010 to 2015;
- A [presentation](#) describing trends in the Department of Defense's use of funding designated for overseas contingency operations and their effects on the department's overall spending;
- A [presentation](#) providing an overview of *The Budget and Economic Outlook: 2019 to 2029*; and

- A [presentation](#) describing how CBO produces its baseline budget projections.

Members of CBO's staff also gave presentations about the agency's broader processes for conducting analyses at many other venues (listed in parentheses):

- A [presentation on macroeconomic analysis at CBO](#) (at the Inforum Annual Conference at the University of Maryland, College Park) described the agency's process for creating baseline economic forecasts and analyzing the effects on the overall economy of some proposed changes in tax and spending policies.
- A [presentation about HISIM2](#) (to the Health Economics Scientific Interest Group at the National Institutes of Health) described the new health insurance simulation model that CBO uses to generate estimates of health insurance coverage and premiums for the population under age 65.
- A [presentation on reconciling data on transition tax payments under the 2017 tax act](#) (at the National Tax Association's 112th Annual Conference on Taxation) explained how estimates of those tax payments affect CBO's baseline projections of corporate income tax revenues.
- A [presentation on CBO's 10-year budget and economic projections](#) (at a conference organized by the Foundation for Teaching Economics) described the projections and the budgetary effects of selected alternative policy assumptions.
- A [presentation on CBO's relationships with other government agencies](#) (at the Budget Line of Business's Fall Forum) described the information from other agencies that CBO uses to prepare its cost estimates and baseline budget projections.
- A [presentation on the process that CBO uses to develop the economic projections that underlie its long-term budget projections](#) (to the Social Security and Medicare Trustees Working Group) described CBO's policy growth model and the economic framework underlying it.
- A [presentation on HISIM2](#) (at the American Enterprise Institute) described the new model's underlying data, calibration estimates, and code segments, as well as the modeling results that were used in the baseline projections of health insurance coverage that CBO produced in spring 2019.
- A [presentation about CBO's 10-year budget and economic projections](#) (at the National Association of Business Economists [NABE] Foundation's 16th Annual Economic Measurement Seminar) described how the agency produces those projections and how they can be used for budget and economic analyses.
- A [presentation on modeling employers' decisions about whether to offer employment-based health insurance](#) (at the 8th Annual Conference of the American Society of Health Economists) described how synthetic firms are created to mimic the real-world variations among firms and then used to model those decisions.
- A [presentation on HISIM2](#) (at the 8th Annual Conference of the American Society of Health Economists) described the model's specifications, CBO's calibration estimates, and the modeling results underlying the agency's spring 2019 baseline projections of health insurance coverage.
- A [presentation about overlapping generations \(OLG\) models](#) (at the National Tax Association's 49th Annual Spring Symposium) highlighted the similarities and differences among OLG models and the lessons learned from CBO's December 2018 symposium on such models.
- A [presentation on the process for developing the economic projections that underlie CBO's long-term budget projections](#) (at the 2019 Social Security Technical Panel) described CBO's policy growth model and the economic framework underlying the model.
- A [presentation about CBO's use of outside experts](#) (at the 11th Annual Meeting of the Organisation for Economic Co-operation and Development [OECD] Network of Parliamentary Budget Officials and Independent Financial Institutions) described how CBO selects outside experts, including those on the Panel of Economic Advisers, Panel of Health Advisers, and Technical Review Panel for HISIM2.

- A presentation about CBO's transparency efforts (at the 11th Annual Meeting of the OECD Network of Parliamentary Budget Officials and Independent Financial Institutions) described how CBO has added and shifted resources to increase its transparency efforts and the agency's goals in doing so.

Other presentations were about specific analyses that the agency had recently published. They afforded CBO staff the opportunity to offer explanations, answer questions, and gather feedback to improve the quality of future related work. The presentations covered these topics and were delivered at the venues or to the groups listed in parentheses:

- Financial regulation and the federal budget (at the Mortgage Bankers of America);
- The effects of increasing the federal minimum wage on employment and family income (to the Department of Economics at Haverford College);
- The advantages and disadvantages of cash and accrual measures when accounting for various federal insurance programs and federal retirement programs (at the Southern Economic Association's Annual Meeting);
- The effects of increasing the federal minimum wage on employment and family income (at the University of Michigan's 67th Annual Economic Outlook Conference);
- An overview of the budget and economic outlook for 2019 to 2029 (to the American Association for Budget and Program Analysis);
- Prospects for the Department of Defense's acquisition budget over the next decade (at the Professional Services Council's Vision Conference 2019);
- The Navy's 2020 shipbuilding plan and alternatives for the future (at the National Defense Industrial Association's 24th Annual Expeditionary Warfare Conference);
- The budget outlook through 2049 (to the National Association of State Budget Officers);
- The advantages and disadvantages of cash and accrual measures when accounting for various federal insurance programs and federal retirement programs (at the annual conference of the Association for Budgeting and Financial Management);
- Congressional proposals related to a lapse in appropriations (at the annual conference of the Association for Budgeting and Financial Management);
- The current outlook for the economy and the budget (at PwC);
- Fiscal policy choices (to the Aspen Economic Strategy Group);
- The reasons for the slowdown of productivity growth in CBO's economic forecast (at the NABE Foundation's 16th Annual Economic Measurement Seminar);
- The choices made by eligible veterans and their families when using the Post-9/11 GI Bill (at the Annual Conference of the Western Economic Association International);
- The age and condition of today's Air Force fleet, CBO's projections of future aircraft procurement, and procurement costs in peak years (at the Annual Conference of the Western Economic Association International);
- Congressional proposals related to a lapse of appropriations (at the American Association of Budget and Policy Analysis's Spring 2019 Symposium);
- The budget and economic outlook through 2029 (at the University of Oregon's Lundquist College of Business, College of Arts and Sciences, and Wayne Morse Center for Law and Politics);
- The budget and economic outlook through 2029 (at the Fixed Income Forum 2019 Spring Roundtable);
- The budget and economic outlook through 2029 (to the American Business Conference);

- [The budget and economic outlook through 2029](#) (at the 35th Annual NABE Economic Policy Conference);
- [The operating costs and aging of the Air Force's aircraft](#) (at the National Academies of Sciences, Engineering, and Medicine Air Force Studies Board);
- [Federal grants to state and local governments for investment](#) (to the National Federation of Municipal Analysts);
- [Funding for Navy ship construction under the Budget Control Act and the Navy's 2019 shipbuilding plan](#) (at the Surface Navy Association's 31st National Symposium); and
- [The current outlook for Navy shipbuilding](#) (at the Bank of America Merrill Lynch Defense Outlook Forum).

Accessibility. In 2019, CBO implemented a new layout for its cost estimates that highlights key parameters as

well as information needed by the Congress for budget enforcement procedures. The agency also began publishing cost estimate tables in spreadsheet format on its website to facilitate use of the information.

In addition, CBO improved readers' access to cost estimates. New, predictable URLs help readers locate the estimates more quickly on CBO's website. New filters allow readers to [search for estimates](#) by their 10-year total effects on direct (mandatory) spending, revenues, and deficits. Each estimate's web page now includes a link to the bill's text and legislative information at [Congress.gov](#). Finally, basic information about each estimate is now available in XML format.

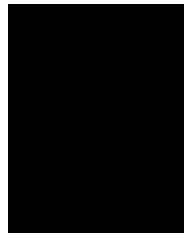
In 2019, CBO published the data about the agency's 10-year baseline projections for selected programs as Excel spreadsheets in addition to PDFs to make the data easier to use. Additionally, with the release of *An Analysis of the President's 2020 Budget*, CBO began publishing selected reports in HTML format to make them easier to read on mobile devices.



List of Figures

Figures

1. Sample Timeline for Measuring Errors in CBO's Projections of Deficits for the Budget Year	8
2. Projection Errors for Outlays	14
3. Differences Between CBO's and the Social Security Trustees' Projections of the Actuarial Balance	17
4. The Uncertainty of CBO's Projections of Output	20
5. The Federal Budget in 2018	22



About This Document

The Congressional Budget Office prepared this report in fulfillment of its requirement to report on its transparency plans. It was written by Rebecca Chenevert and Keren Hendel, with contributions from Leigh Angres, Molly Dahl, Joseph E. Evans Jr., Michael Falkenheim, Kathleen FitzGerald, Sebastien Gay, Theresa Gullo, Joseph Kile, Deborah Kilroe, John Kitchen, John McClelland, Alexandra Minicozzi, David Mosher, Julie Topoleski, Jeffrey Werling, and Chapin White.

The report was reviewed by Jeffrey Kling and Robert Sunshine. The editor was Bo Peery, and the graphics editor was Robert Rebach. An electronic version with hyperlinks to the products referenced in the text is available on CBO's website (www.cbo.gov/publication/56236).

The agency continually seeks feedback to make its work as useful as possible. Please send any comments to communications@cbo.gov.

A handwritten signature in black ink, appearing to read "Phillip L. Swagel".

Phillip L. Swagel
Director
March 2020